REMARKS

Claims 1, 4-7, 14-16, and 18-22 are in the application for further consideration.

Claim 1 has been amended to define the composition as "consisting essentially of" so as to exclude ingredients that are non-essential and harmful to rotolining/adhesion application of the claimed invention. Claim 1 has also been amended in response to the criticism in the rejection (p. 5) that "stabilized" in claim 1 does not distinguish from the thermal stabilizer present in the Tomihashi et al. (Tomihashi) composition. The stabilization by fluorine exposure is disclosed on p. 5, l. 33-38. Claim 1 has also been amended to recite the timing of the fluorine exposure, i.e. the composition of copolymer and metal powder is formed after the fluorine exposure stabilization of the copolymer (sentence bridging pp. 6 and 7). Claim 1 has been further amended to have the peel strength refer to the rotolining of the composition in response to the criticism in the rejection (p. 4) that the recitation of minimum peel strength in the claim is incomplete.

New claims 19 and 20 has been added to recite greater detail on the fluorine exposure result as disclosed on in the sentence bridging pp. 5 and 6.

New claim 21 has been added in response to the citation of the Tomihashi composition, i.e. to exclude at least the presence of the special TiO_2 particles, which is the focus of the Tomihashi invention. The present specification discloses the copolymer and the metal powder ingredients in the composition, indicating possession of the invention recited in this new claim.

New claim 22 is directed to a rotolining, rather than the composition, because of the disrespect in the rejection (p. 4) for "rotolining" in the preamble of claim 1. If the Examiner prefers different language, e.g. Rotolining of the composition of claim 1, such alternative would be acceptable.

The recitation of "rotolining" in the preamble of claim 1 is intended as a limitation on the scope of the claim and is believed to legally acceptable as such. Legal acceptability is indicated when the preamble is essential to point out the invention, Kropie v. Robie and Mahlman, 88 USPQ 478, 481 (CCPA 1951). That the claimed composition is a rotolining composition is clear from the rotolining adhesion result recited in the body of the claim. In Corning Glass Works v. Sumitomo Electric, 9 USPQ2d 1962 (Fed. Cir. 1989), the Court looked at the specification description of the invention as being a waveguide in determining that "waveguide" in the claim preamble was a limitation that distinguished from the optical fiber of the prior art. The Court considered that to ignore the "waveguide' limitation would be divorced from reality (p. 1966). The present specification makes it clear that the composition is a rotolining composition and nothing more. The rejection asserts that the composition of claim 1 is independent of the preamble. The recitation of the minimum peel strength in the

body of claim 1 together with the recitation of rotolining in the preamble are integral parts of the "subject matter as a whole" (35 U.S.C. 103(a)) to be compared to the prior art.

The rejection criticizes claim 1 for not correlating the peel strength to any compositional limitation (p. 7). It is not certain what if any amendment would satisfy this criticism. Possibly there is a misunderstanding of the effects that contribute to peel strength in the present invention. Aspects of the present invention include the discoveries that (i) addition of a small amount of non-bubble promoting metal powder to TFE/PPVE copolymer enables it to adhere to a substrate and (ii) the same addition to TFE/PEVE copolymer gives a much better adhesion result. Neither copolymer by itself adheres to substrate as disclosed in Applicant's Example 1 (p. 11, 11-14), which confirms the disclosure in the Scheirs publication referred to in the paragraph bridging pp. 1 and 2 of the present specification. Because of the better result with TFE/PEVE copolymer, this is the focus of the claims to the present invention. The TFE/PEVE copolymer, which by itself has no peel strength, nevertheless makes some contribution to the peel strength as indicated by the improvement over TFE/PPVE copolymer when combined with the small amount of metal powder. Example 2 discloses that stabilization of the TFE/PEVE copolymer causes the copolymer/metal powder composition to lose some of its adhesive bond to the substrate. The resultant peel strength of 53 lb/in for the stabilized TFE/PEVE copolymer is, however, very high. The claims to the present invention are limited to stabilized TFE/PEVE copolymer as the recipient for the metal powder additive because the combination of this copolymer with metal powder has been found to provide a superior rotolining in commercial operation. The minimum peel strength result recited in claim 1 thus takes all these factors into account: identity of the copolymer and its stabilized condition, along with the presence of the metal powder and the amount of such powder and the copolymer particle size and shape. This result effect is believed to be appropriate in defining the interplay between all these factors.

With respect to the obviousness rejection based on Tomihashi, based on the rejection comparison of a combination of certain Tomihashi disclosures with Applicant's claims, missing from this comparison is any explanation how one skilled in the art would envision this combination without guidance provided by knowledge of the present invention. As seen from the totality of the Tomihashi disclosure, to be discussed below, one skilled in the art neither envisions the invention of claim 1 solely from the Tomihashi disclosure nor receives any suggestion of such invention solely from Tomihashi.

With respect to polymer disclosure, Tomihashi discloses several different perfluoropolymer families, one of which is PFA, three different PFA polymers, one of which is TFE/PEVE copolymer, with TFE/PPVE copolymer being the preferred PFA(col. 2, l. 35-45).

With respect to thermal stabilizer, Tomihashi discloses three groups thereof: organosulfurous, amine, and/or metal powder (col. 3, l. 28-30). Combinations of these thermal stabilizers are preferred, within which the metal powder may or may not be present (col. 3, l. 31-35). The metal powder is preferably used in the combination with the organosulfurous and amine thermal stabilizers and not by itself (col. 4, l. 64-67). The organosulfurous and amine thermal stabilizers, preferably associated with metal powder thermal stabilizer in Tomihashi, are not present in the claim 1 composition because of the discoloring effect these stabilizers have on the perfluoropolymer, which effect is disclosed in Tomihashi (col. 1, l. 28-34). In the organosulfurous/amine/metal powder combination of Tomihashi, the metal powder is either 0 to 50 or 0 to 30 parts of the combination (col. 5, l. 1-4). As to the amount of thermal stabilizer, the Tomihashi disclosure of 0.5 to 3.0 parts by weight per 100 parts of resin (col. 5, l. 5-7) cannot refer to the metal powder alone, since Tomihashi has already disclosed in the preceding paragraph that the amount of metal powder can be 0.

With respect to adhesion, there is no disclosure of any of the Tomihashi composition ingredients contributing to adhesion of the composition to a steel, regardless of the coating application method. One skilled in the art knows that PFA by itself does not adhere to steel. This is confirmed by Applicant's Example 1 and by the Scheirs publication, both mentioned above. This is why non-stick perfluoropolymer coatings on cookware require primer to adhere the perfluoropolymer coating to the cookware surface. This is why the Tomihashi Examples uses a primer layer on the aluminum substrate (col. 6, 43-45) and on the iron substrate, which is both sand blasted and then coated with two layers of different primers (sentence bridging cols. 6 and 7).

The rejection notes that the Tomihashi coating is not envisioned as being removed from the substrate (sentence bridging pp. 4 and 5). This expression of result for Tomihashi in the rejection overlooks the presence of the primer layer to obtain the adhesion to the metal substrate. The presence of the primer layers in the Tomihashi Examples cannot be considered as unnecessary, and certainly does not point to a Tomihashi composition that will adhere to steel without using an intervening primer layer. There is no guidance provided solely by Tomihashi towards any composition that changes the well-known non-adhesiveness of PFA so that primer is unnecessary to obtain the adhesion or towards the possibility that metal powder in a certain amount will provide this result. Thus, there is no guidance solely by Tomihashi towards the composition of the rotolining composition of the present invention. Guidance provided solely by knowledge of the present invention is not prior art to which the claimed invention must be compared under 35 U.S.C. 103(a).

The rejection asserts that the prior art composition necessarily possess the claimed peel strength, or in other words that this peel strength is inherent in the prior art compositions

(sentence bridging pp. 6 and 7, and p. 8). This assertion is inapplicable to the facts. Tomihashi's use of primer in his Examples contradicts that notion that the Tomihashi composition adheres to steel, with a peel strength of at least 25 lb/in without the need for the primer. Tomihashi does not disclose any other specific composition on which the determination of inherency can be based. Nor does this minimum peel strength necessarily result from the general disclosures of ingredients and amounts, including the fact that metal powder may or may not be present, and if present, then in an unknown amount. The fundamental deficiency of the Tomihashi disclosure (see below) with respect to the invention of claim 1 indicates that the peel strength result in claim 1 is not necessarily present in Tomihashi, i.e. is not inherent in Tomihashi. For inherency to exist, the claimed result must necessarily occur, i.e. that it may occur is not enough, Continental Can Co. v. Monsanto Co. 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) and In re Robertson, 49 USPQ2d 1949, 1950-1951 (Fed. Cir. 1999).

The fundamental deficiency of Tomihashi with respect to the invention of Applicant's claim 1 is that Tomihashi by itself does not disclose or suggest –

- selection of the less preferred TFE/PEVE copolymer,
- combining this non-preferred copolymer with metal powder, which is not preferred for use by itself,
- in an amount by itself that necessarily falls within the claimed range of 0.2 to 2 wt% as recited in claim 1,
- to obtain high adhesion of the composition to a steel substrate without the need for an intervening primer.

The rejection refers to Buckmaster for his disclosure of sphere factor less than 1.5 for the PFA granules (rejection, p. 6) and the exposure of these granules to fluorine to prevent bubbling of the PFA during thermal processing (rejection, sentence bridging pp. 5 and 6). Incorporation of either of these disclosures into Tomihashi does not cure the fundamental deficiency of Tomihashi. Moreover, one skilled in the art is not motivated to apply either of these Buckmaster-disclosed features to the Tomihashi teaching.

Concerning the Buckmaster disclosure of sphere factor, the granules on which the sphere factor is determined have the characteristic of not containing metal, which Buckmaster considers to be a contaminant. Thus, Buckmaster discloses that his granules should be low in metal contamination such as occurs when the PFA is processed in conventional thermoplastic metal processing equipment (p. 2, l. 28-33), and that these granules achieve this result by being made by a granulation process not involving the melting in conventional thermoplastic processing equipment (p. 3, l. 3-6). It would be an anathema to this teaching to insert the fluorine exposed granules of Buckmaster into any metal powder composition of Tomihashi.

Concerning the Buckmaster disclosure of fluorine exposure preventing the PFA from bubbling, there is no motivation to incorporate this effect into Tomihashi because the Tomihashi composition is already bubble-free by virtue of the presence of the thermal stabilizer. In this regard, Tomihashi discloses that fluorine-containing resin powder foams due to thermal deterioration during baking and the addition of thermal stabilizer inhibits this deterioration (col. 1, l. 21-28). This fact situation is identical to the fact situation for the Wu/JP'593 combination of references covered by the statement of non-obviousness on p. 2 of the rejection. The invention of claim 1 is likewise non-obvious over Tomihashi/Buckmaster

The unpredictability of the strong adhesive bond achieved by the stabilized TFE/PEVE copolymer/metal powder composition is a surprising result, which is part of the claimed invention "as a whole" (35 U.S.C. 103(a)) and indicative of patentability, In re Soni, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995), In re Chupp, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987).

Claims 4-7, 14-17, 18-20, and 22 are unobvious and therefore patentable on the same basis as claim 1.

Claim 21 is unobvious over the prior art on the additional basis that this claim excludes the surface treated TiO_2 ingredient of Tomihashi, which is essential in Tomihashi for obscuring the discoloring effect of the thermal stabilizer (col. 1, l. 28-34, l. 56-59, and col. 2, l. 3-4). This claim also excludes the organic thermal stabilizers that preferably accompany metal powder stabilizer, if used at all. There is no suggestion to one skilled in the art arising solely from Tomihashi to eliminate these essential ingredients in an attempt to arrive at the claimed invention.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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